Eucalyptus ceracea, E. rupestris and *E. chlorophylla* (Myrtaceae), three new species in the Kimberley Division of Western Australia

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Abstract

Brooker, M.I.H. and Done, C.C. *Eucalyptus ceracea, E. rupestris* and *E. chlorophylla* (Myrtaceae), three new species in the Kimberley Division of Western Australia. Nuytsia 5(3): 381-390 (1986). Three new species occurring in the Kimberley Division of Western Australia, *E. ceracea, E. rupestris* and *E. chlorophylla* are described and illustrated. A brief account of eucalypt collecting and publications concerning eucalypts in the Kimberley area is also given.

Introduction

No systematic survey of the eucalypts of the Kimberley Division (Mulcahy & Bettenay 1972) has ever been made. Various specimens have been collected since the early nineteenth century and two of the earliest known collections, i.e. those of Allan Cunningham from along the coast in 1820, include types. These are Cunningham 241/1820 (*E. miniata* Cunn. ex Schauer) from York Sound, and Cunningham 242/1820 (*E. clavigera* Cunn. ex Schauer) from Careening Bay.

The next significant expeditions in the region for the collection of eucalypts, were those of W.V. Fitzgerald in 1905 and 1906. From specimens collected by Fitzgerald and in some cases named and/or described by him, the following species were published, *E. houseana* W.V. Fitzg. ex Maiden (1915), *E. confluens* W.V. Fitzg. ex Maiden (1915), *E. argillacea* W.V. Fitzg. in Maiden (1918), *E. cliftoniana* W.V. Fitzg. in Maiden (1919) (syn. *E. pyrophora* Benth.), *E. lirata* W.V. Fitzg. ex Maiden (1920), *E. collina* W.V. Fitzg. in Maiden (1923), *E. perplexa* Maiden & Blakely in Maiden (1929) (syn. *E. jensenii* Maiden), *E. macropoda* Blakely (1934) (syn. *E. collina*), *E. zygophylla* Blakely (1934), and *E. fitzgeraldii* Blakely (1934).

Two new eucalypts were named from Kimberley collections made by C.A. Gardner in 1921, viz. *E. herbertiana* Maiden (1923) and *E. arenaria* Blakely (1934).

Since Gardner's expedition, only one new *Eucalyptus* species has been published from collections made in the Kimberley Division. This is *E. cuppularis* Gardner (1964) which was described from specimens collected by its author in 1951. There are two other species occurring in the Kimberley area which were apparently not known by their authors at the time of publication to occur in the region. These are *E. apodophylla* Blakely & Jacobs (Blakely 1934) and *E. abbreviata* Blakely & Jacobs (Blakely 1934) which were described from populations in the Northern Territory.

The only specifically taxonomic treatment of the Kimberley eucalypts is that of Blake (1953) who cited remarkably few specimens from the Kimberley Division. His treatment was primarily concerned with the Northern Territory, therefore he excluded the Western

Australian endemics, *E. collina*, *E. lirata* and *E. houseana*. He included another endemic, *E. zygophylla* Blakely, only because his treatments of the *Eucalyptus* series *Clavigerae* (Maiden) S. Blake and *Corymbosae* (Benth.) Maiden ("*E.* subg. *Blakella*" and "*E.* subg. *Corymbia*" respectively of Pryor and Johnson's 1971 informal classification) were essentially revisions of both groups.

Pryor and Johnson (1971), in effect, reviewed many of Blake's conclusions on the status and synonymies of the Kimberley species. In their classification they recognised about 40 species in the region. Since then no new species for the region have been published and no published species from elsewhere have been found to extend to the area.

In 1972-1974, twenty nine species of *Eucalyptus* from the Kimberley Division were treated in the Commonwealth Forestry and Timber Bureau's Forest Tree Series Leaflets (Hall and Brooker 1972-1974, Turnbull and Hall 1973).

In recent years important collections have been made by A.S. George (1974-1978) and K.F. Kenncally (1974-1984). These were reported in the results of comprehensive biological surveys of the Prince Regent River Reserve (Miles & Burbidge 1975) and the Drysdale River National Park (Kabay & Burbidge 1977) in which they listed 15 and 31 eucalypt species respectively. In the former publication, the specimen, A.S. George 12839, is the earliest known collection of *E. rupestris* which is described in this paper.

The recent book by Petheram and Kok (1983) includes descriptions and illustrations of 30 species of eucalypts. It is the most comprehensive treatment of Kimberley eucalypts so far published, although the omission of *E. cupularis* appears to be an error.

In the last few years further access to remote areas and critical examination of eucalypts in better-known areas have resulted in the discovery of several new species. We describe three new species in this paper. A fourth new species in the Kimberley Division is currently being described by C.R. Dunlop and C.C. Done. Insufficient information and material have prevented us from deciding on the status of some additional populations. These include a taxon with an obvious affinity to *E. microtheca*, and also a taxon belonging to Pryor & Johnson's informal "*Eucalyptus* subgenus *Blakella*".

Descriptions of new species

Eucalyptus ceracea Brooker & Done, sp. nov. (Figures 1 and 2)

Eucalypto phoeniceae affinis a qua statura constanter inferiore, foliis arboris maturae omnino juvenilibus, et arbore tota (cortice excepto) pruinosa differt.

Typus: 33 km south-east of King George Falls, Kimberley district of Western Australia (14°18′S, 127°29′E), 14 July 1982, *C. Done* 612 (holo: PERTH; iso: FRI, NSW).

Small *tree* up to 3 m tall with yellow, flaky, fibrous bark. *Cotyledons* reniform, petioles ascending, hypocotyl very short or apparently absent. *Stems* in seedling and juvenile plants hairy. *Seedling leaves* decussate, sessile, 1 or 2 pairs, elliptical, up to 2 x 1 cm, slightly hairy. *Juvenile leaves* decussate, very shortly petiolate, many pairs, ovate, up to 4.5 x 3 cm, densely hairy, glaucous. *Crown of mature tree* entirely of sessile, glaucous juvenile leaves. *Inflorescences* simple, axillary, to 9-flowered; all inflorescence structures covered with white wax. Peduncles stout, flattened, up to 3 cm long. *Buds* on short stout pedicels, clavate or pyriform, up to 1.6 x 0.7 cm, prominently glandular, with a single, obtusely conic to hemispherical operculum which is somewhat lobed at summit. *Stamens* all fertile, inflexed in bud, bright orange at flowering. *Anthers* versatile, dorsifixed, oblong to ovoid, opening by parallel, longitudinal slits. *Ovules* in 4 vertical rows. *Fruit* very shortly

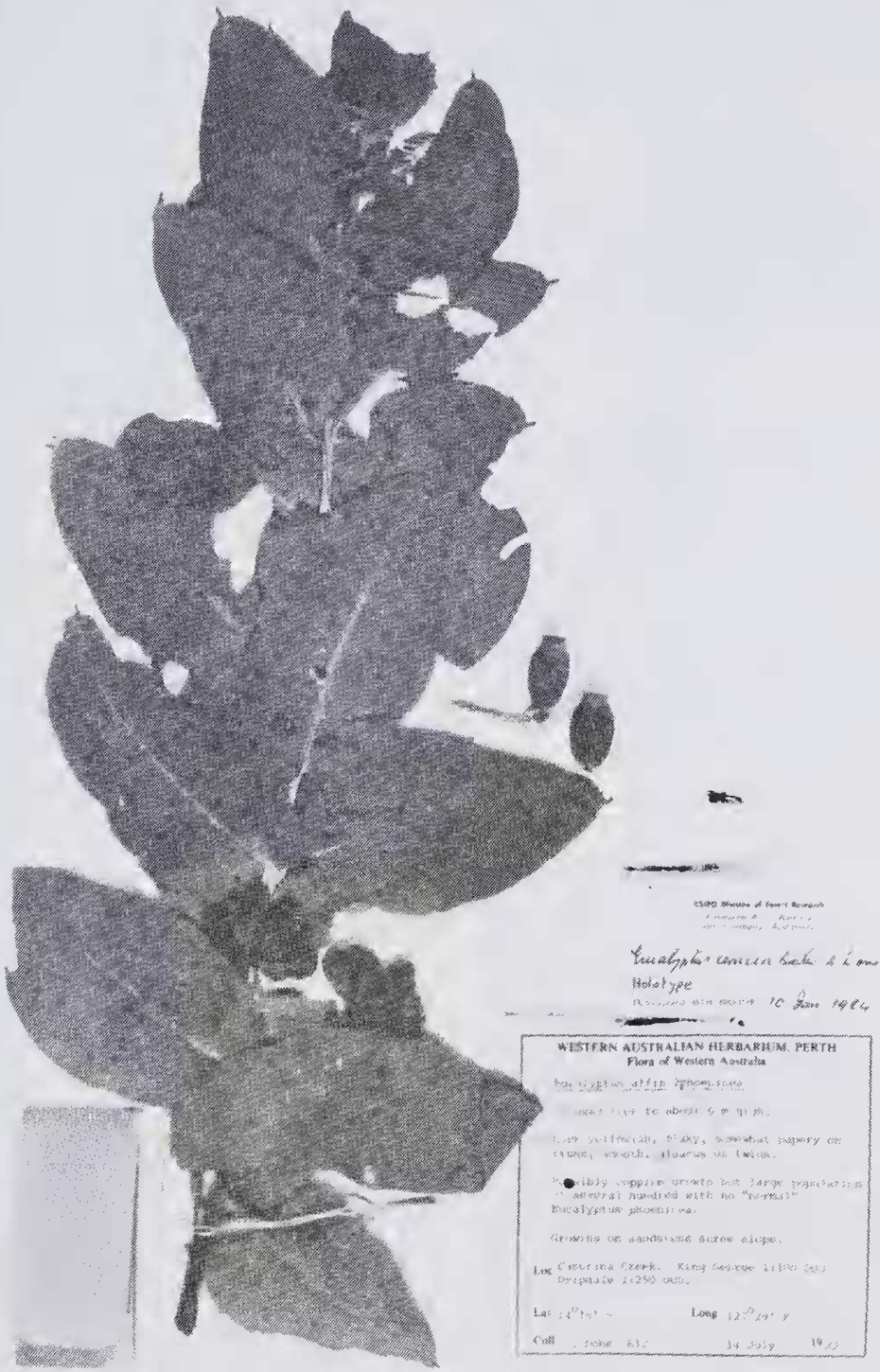

Figure 1. Holotype of *Eucalyptus ceracea* (*Done* 612).

pedicellate, cylindrical to barrel-shaped, usually narrowed towards the rim into a neck, up to 2.2 x 1.3 cm; loculi 2(3). *Seed* light reddish brown, oval to flattish, smooth or with a few wrinkles, hilum ventral, central.

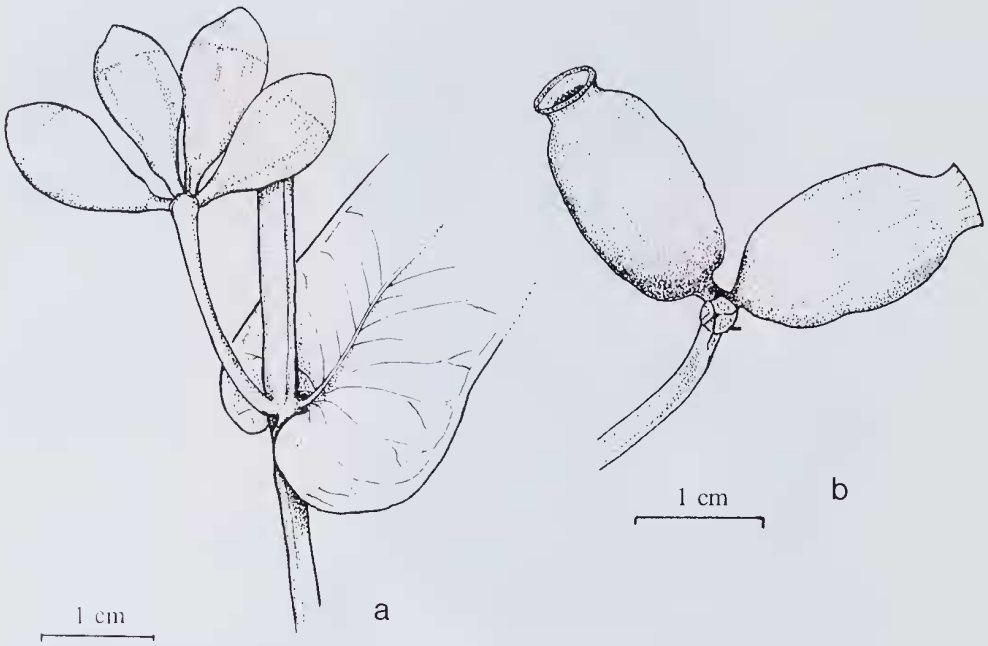

Figure 2. *Eucalyptus ceracea* a Buds (*Done* 612). b Fruit (*Done* 612).

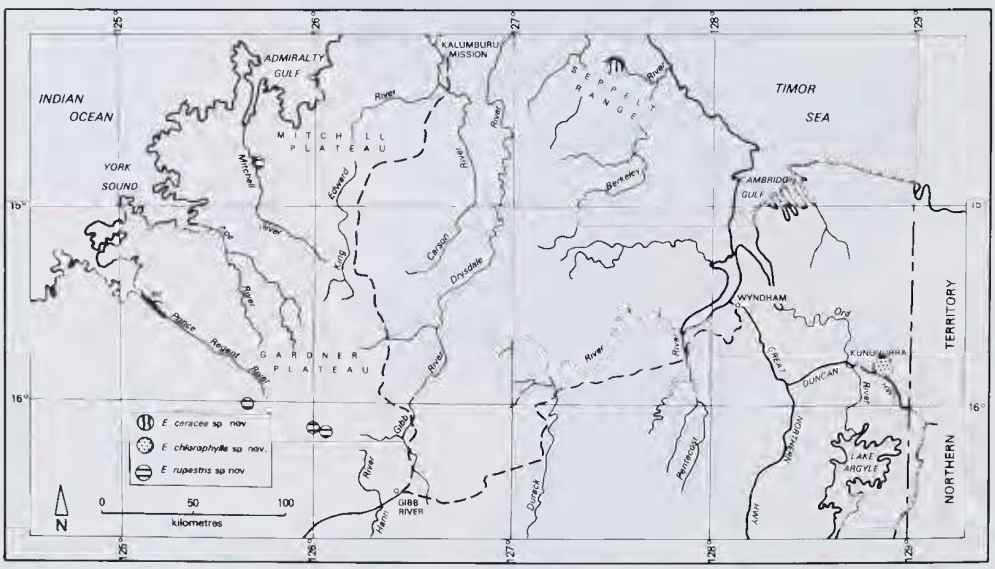

Figure 3. Distribution of *Eucalyptus ceracea, E. rupestris, E. chlorophylla*

Other specimen examined. Type locality, 1 Nov. 1982 *M.I.H. Brooker* 7771 (FRI, PERTH, NSW).

Distribution. Known only from the type locality where it occurs as a small pure population covering about 1 hectare half way up the north face of a ridge (Figure 3).

Flowering period. August-November.

Etymology. The specific epithet alludes to the extreme waxiness of the whole plant.

Affinities. The seedlings, mature bark, buds, flowers and fruits closely resemble those of *E. phoenicea. E. ceracea* is usually a smaller tree and differs strikingly in the entirely juvenile crown and conspicuously glaucous upper axis, leaves, buds and fruit. In the informal classification of Pryor & Johnson (1971), the species would be placed adjacent to *E. phoenicea* in the informal "*E.* subgenus *Eudesmia*, sect. *Apicaria*" (*E.* ser. *Miniatae* Blakely).

Notes. Eucalyptus ceracea is a small tree of striking appearance due to its yellow flaky bark, extreme white waxiness of the leaves, buds and fruits, and orange flowers. It has obvious potential as an ornamental plant. It occurs on the northern face of the Seppelt Range among jumbled boulders of coarse grained quartz sandstone. The understorey is of spinifex (*Plectrachne* sp.) and associated tree species include *Eucalyptus tectifica* and *Erythrophleum chlorostachys* (F. Muell.) Baill. We suggest the common name "Seppelt Range Gum".

Eucalyptus rupestris Brooker & Done, sp. nov. (Figures 4 and 5)

Arbor ad 5 m alta, cortice laevi albido. Folia plantularum petiolata. Folia adulta petiolis gracilibus elliptica vel lato-lanceolata, ad 7 x 2.5 cm, pallido-virentia, hebetia. Inflorescentiae axillares, 7(9) floribus. Pedunculi graciles, breves. Fructus breviter pedicellati, cylindrici, ad 0.5 x 0.3 cm.

Typus. Prince Regent River Reserve (15°32′S, 125°13′E), Western Australia, 30 August 1974, *A.S. George* 12839 (holo: PERTH; iso: FRI)

Tree up to 5 m tall with smooth, very powdery light orange-white bark, sometimes black-spotted. *Cotyledons* reniform. *Seedling leaves* decussate, petiolate, 2 or 3 pairs, ovate to spathulate, up to 1.5 x 1 cm. *Juvenile leaves* decussate, petiolate, many pairs, orbicular, up to 4 x 4 cm. *Adult leaves* alternating, on slender petioles to 2 cm long, elliptical to broad-lanceolate, up to 7 x 2.5 cm, thin, dull light green, concolorous. *Inflorescences* simple, axillary, 7(9)-flowered, rarely clustered on leafless, apparently terminal shoots. *Peduncles* slender, up to 0.4 cm long. *Very young buds* clavate to ovoid; outer operculum shed as fragments, inner operculum obtusely conical. *Mature buds* not seen. *Fruit* shortly pedicellate, cylindrical (sometimes slightly contracted near the rim to form a short neck), up to 0.5 x 0.3 cm; loculi 3; rim thin; disc steeply descending. *Seed* dark brown, irregular in shape, mostly elongated, flattish, with one end pointed, with a shallow reticulum on the dorsal side, hilum ventral, central.

Other specimens examined. WESTERN AUSTRALIA: Glider Gorge, Carson Escarpment, Drysdale River National Park (± 14°49′S, 126°49′E), 10 August 1975, *A.S. George* 13646 (CANB, PERTH); top of Carson Escarpment at Coucal Gorge, Drysdale River N.P. (± 15°02′S, 126°49′E), 15 August 1975, *A.S. George* 13870, 13872 (CANB, PERTH); Euro Gorge, Drysdale River N.P. (15°03′S, 126°44′E), 17 August 1975, *K.F. Kenneally* 4399 (CANB, PERTH); Morgan Falls, Worriga Gorge, Drysdale River N.P. (± 15°02′S, 126°40′E), 19 August 1975, *A.S. George* 14073 (CANB, PERTH); 49 km west

Figure 4. Holotype of *Eucalyptus rupestris* (*A.S. George* 12839).

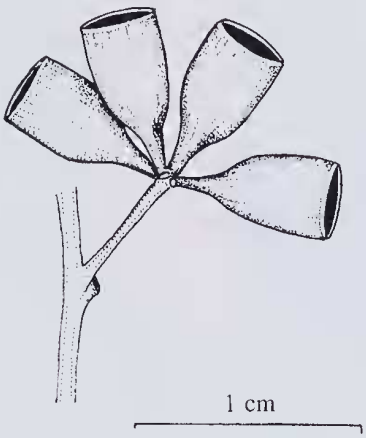

Figure 5. Fruit of *Eucalyptus rupestris* (*Done* 653).

of Mt Elizabeth Station (new) (16°09′S, 125°59′E), 30 Oct. 1982, *M.I.H. Brooker* 7763 (FRI, NSW, PERTH); 17.5 km west of Hann River crossing west of Mt Elizabeth Station (new) (16°15′S, 126°05′E), 30 Oct. 1982, *M.I.H. Brooker* 7764, 7765 (FRI, NSW, PERTH); Mitchell Falls (14°49′S, 125°41′E), 29 June 1983, *C. Done* 653 (PERTH).

Distribution. Kimberley Division of Western Australia. Currently known only from the Prince Regent River, Caroline Ranges and Mitchell River areas of the northern part of the Kimberley Division (Figure 3).

Flowering period. March-July.

Etymology. The specific epithet refers to the rocky situation in which the new species has always been found.

Affinities. Without mature buds and flowers, we cannot be certain of the natural affinity of *E. rupestris*. The buds are bi-operculate. The most cursory observation of the trees eliminates any affinity with two bi-operculate subgeneric groups, viz. "*Blakella*" and "*Corymbia*", of the informal Pryor and Johnson classification (1971). This conclusion is substantiated by examination of the seeds of *E. rupestris* which have no morphological similarities with the patelliform seeds of "*Blakella*" and the winged seeds of "*Corymbia*". In habit, habitat and bark, *E. rupestris* resembles *E. umbrawarrensis* Maiden but close examination distinguishes it by its orbicular seedling leaves (ovate in *E. umbrawarrensis*) and dull, elliptical to broad-lanceolate adult leaves (glossy, narrowly lanceolate in *E. umbrawarrensis*). The fruit of the two species are similar although the fruit pedicels in *E. umbrawarrensis* are more prominent.

Notes. Eucalyptus rupestris grows in association with *Eucalyptus papuana* F. Muell., *E. brachyandra* F. Muell. and *E. herbertiana* Maiden on deep or skeletal sandy soils in areas of massive sandstone. Whilst the known distribution is restricted to the areas cited, it is likely that the species occurs widely within largely inaccessible areas of sandstone in the northern part of the Kimberley Division. We suggest the common name "Prince Regent Gum".

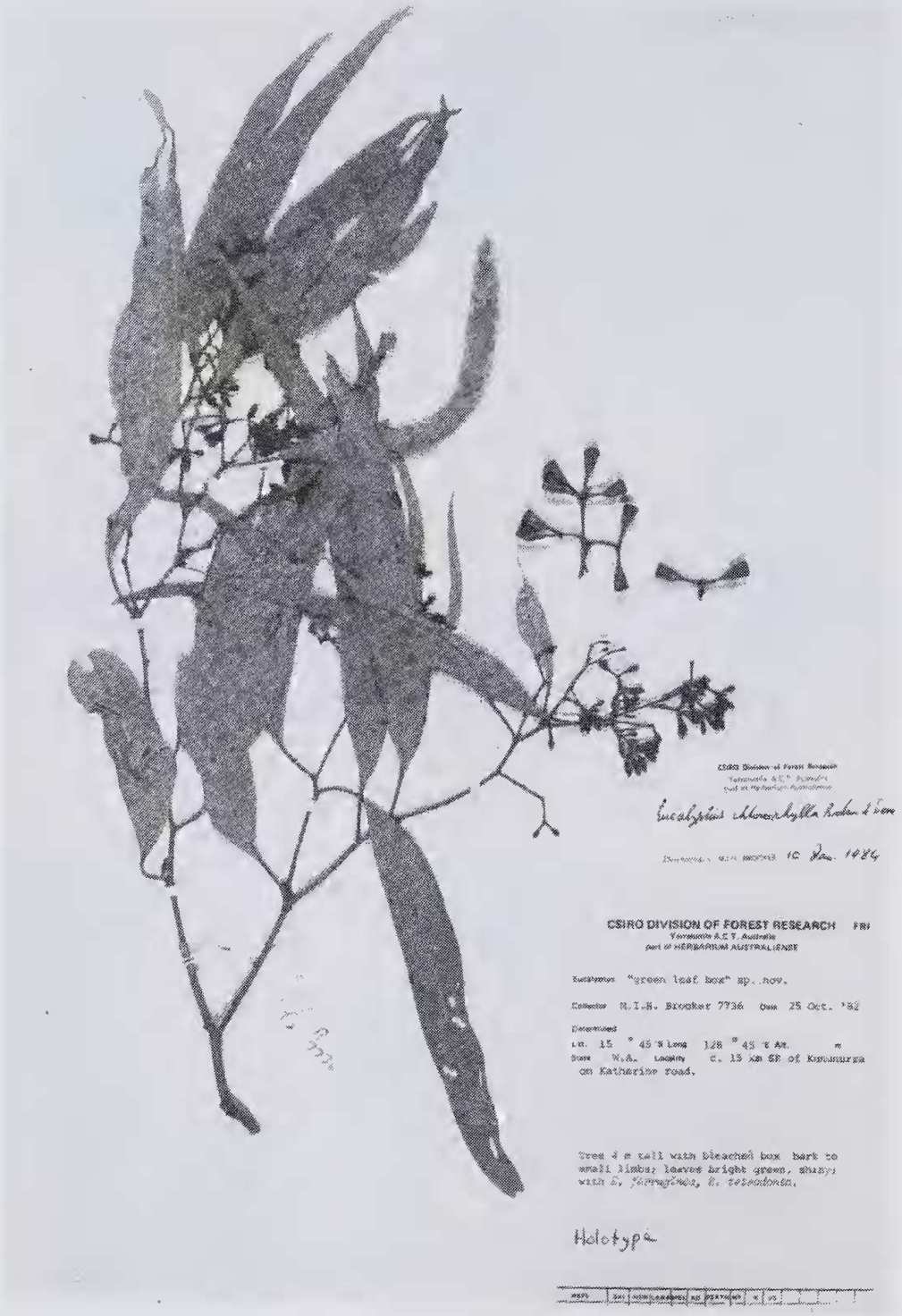

Figure 6. Holotype of *Eucalyptus chlorophylla (M.I.H. Brooker* 7736).

Eucalyptus chlorophylla Brooker & Done, sp. nov. (Figures 6 and 7).

Eucalypto argillaceae affinis a qua foliis adultis angustioribus et prasinis et alabastris fructibusque parvioribus et non-glaucis differt.

Typus. c. 15 km south-east of Kununurra on Katherine road (15°45'S, 128°45'E), Western Australia, 25 Oct. 1982, *M.I.H. Brooker* 7736 (holo: PERTH, iso: DNA, FRI, NSW).

Tree up to 5 m tall with bleached, whitish to yellowish grey box bark up to the small limbs. *Cotyledons* reniform. *Seedling leaves* decussate, petiolate, 2 or 3 pairs, linear to lanceolate, up to 3 x 0.8 cm. *Juvenile leaves* descussate, petiolate, many pairs, lanceolate to broad-lanceolate, up to 9 x 2.3 cm. *Adult leaves* alternating, petiolate, narrow-lanceolate or falcate, up to 18 x 2 cm, bright shining green, concolorous. *Inflorescences* terminal panicles. *Peduncle* up to 1 cm long subtending 7 flowers. *Immature buds* on long pedicels, broadly fusiform, outer operculum shed early in bud development. *Stamens* (seen only in immature bud): outer erect, inner inflexed. *Anthers* (seen only in immature bud) adnate, more or less globular with terminal gland. *Fruit* on long pedicels, obconical or campanulate, up to 0.8 x 0.5 cm; loculi 3 or 4; rim thick; disc prominent, level and just below rim or sloping inwards towards broad-based, but strongly exserted valves. *Seed* dark brown, irregular, flattish, many pointed at one end, dorsal side with shallow reticulum, hilum ventral, central.

Other specimen examined. Type locality (15°50'S, 128°45'E), 5 Sept. 1983, *C. Done* 658 (BRI, FRI, NSW, PERTH).

Distribution. The population from which the type was collected is of up to 20 individuals growing adjacent to the Duncan Highway (Figure 3). *Eucalyptus chlorophylla* may be widely distributed in the Kimberley Division extending as far west as the Erskine Range (C.C. Done personal observations). Discussions with Dr L.A.S. Johnson suggest that the same species occurs in adjacent parts of the Northern Territory.

Flowering period. July-October.

Etymology. The specific epithet alludes to the unusual leaf colour for eucalypts of this region.

Affinities. The bi-operculate buds and adnate anthers place *E. chlorophylla* in Pryor & Johnson's informal "*E.* subgenus *Symphyomyrtus*" sect. *Adnataria* (*E.* sect. *Poranthoroideae* Maiden). The prominent disc of the fruit places it with the northern boxes, viz. "*E.* ser. *Oliganthae* subser. *Oliganthinae*" of the Pryor and Johnson (1971) classification (*E.* ser. *Buxeales* Blakely).

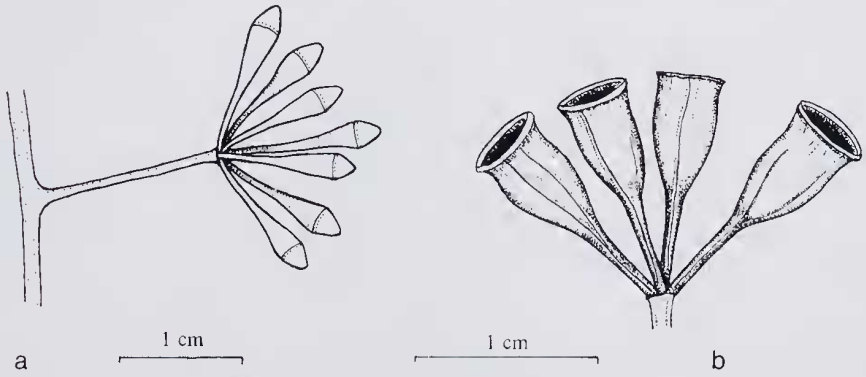

Figure 7. *Eucalyptus chlorophylla* a — Buds (*Done* 667). b — Fruit (*Done* 667).

Notes. E. chlorophylla occurs on sandy soil with lateritic gravel in a depression which is seasonally moist. It is easily separated from all other box species in the Kimberley, viz. *E. patellaris*, *E. oligantha* Schau., *E. microtheca, E. tectifica, E. argillacea*, by the bright green shiny leaves. It grows near *E. ferruginea* Schauer, *E. tetrodonta* F. Muell., *E. tectifica* and *Erythrophleum chlorostachys*. There is an understorey of canegrass (*Sorghum* sp.). We suggest the common name "Green-leaf Box".

Acknowledgements

We are grateful to Ian Scott for his assistance in the field, Barry Rockel for growing the seedlings, Gillian Crook for the drawings, David Holmes for the maps, and Bill van Aken for the photography of the holotypes.

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